

SEQUENCE LISTING

<110> Hannapel, David J.
Chen, Hao
Rosin, Faye M.

<120> POTATO TRANSCRIPTION FACTORS, METHODS OF USE THEREOF,
AND A METHOD FOR ENHANCING TUBER DEVELOPMENT

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<151> 2002-07-19

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<170> PatentIn Ver. 2.1

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Asp Thr Gln Gln Gln Gln Leu Leu Phe Leu Asn Ser Ser Pro Ala
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Ala Ser Asn Ala Leu Cys His Ala Asn Ile Gln His Ala Pro Leu Gln
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Arg Cys Leu Lys Asp Ala Ile Ala Glu Gln Val Lys Ala Thr Ser Lys
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Ser Leu Gly Glu Glu Gly Leu Gly Gly Lys Ile Glu Gly Ser Arg
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Leu Lys Phe Val Asp His His Leu Arg Gln Gln Arg Ala Leu Gln Gln
370 375 380

Ile Gly Met Met Gln Pro Asn Ala Trp Arg Pro Gln Arg Gly Leu Pro
385 390 395 400

Glu Arg Ala Val Ser Val Leu Arg Ala Trp Leu Phe Glu His Phe Leu
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His Pro Tyr Pro Lys Asp Ser Asp Lys Ile Met Leu Ala Lys Gln Thr
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Gly Leu Thr Arg Ser Gln Val Ser Asn Trp Phe Ile Asn Ala Arg Val
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Arg Leu Trp Lys Pro Met Val Glu Glu Met Tyr Leu Glu Glu Val Lys
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Asn Gln Glu Gln Asn Ser Thr Asn Thr Ser Gly Asp Asn Lys Asn Lys
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Glu Thr Asn Ile Ser Ala Pro Asn Glu Glu Lys His Pro Ile Ile Thr
485 490 495

Ser Ser Leu Leu Gln Asp Gly Ile Thr Thr Thr Gln Ala Glu Ile Ser
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Thr Ser Thr Ile Ser Thr Ser Pro Thr Ala Gly Ala Ser Leu His His
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Ala His Asn Phe Ser Phe Leu Gly Ser Phe Asn Met Asp Asn Thr Thr
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Thr Thr Val Asp His Ile Glu Asn Asn Ala Lys Lys Gln Arg Asn Asp
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Met His Lys Phe Ser Pro Ser Ser Ile Leu Ser Ser Val Asp Met Glu
565 570 575

Ala Lys Ala Arg Glu Ser Ser Asn Lys Gly Phe Thr Asn Pro Leu Met
580 585 590

Ala Ala Tyr Ala Met Gly Asp Phe Gly Arg Phe Asp Pro His Asp Gln
 595 600 605

 Gln Met Thr Ala Asn Phe His Gly Asn Asn Gly Val Ser Leu Thr Leu
 610 615 620

 Gly Leu Pro Pro Ser Glu Asn Leu Ala Met Pro Val Ser Gln Gln Asn
 625 630 635 640

 Tyr Leu Ser Asn Asp Leu Gly Ser Arg Ser Glu Met Gly Ser His Tyr
 645 650 655

 Asn Arg Met Gly Tyr Glu Asn Ile Asp Phe Gln Ser Gly Asn Lys Arg
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35 40 45

Ser Ser Phe Ser Ile Ser Asn Gly Met Ile Leu Gly Ser Lys Tyr Leu
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Lys Val Ala Gln Asp Leu Leu Asp Glu Val Val Asn Val Gly Lys Asn
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Ile Lys Leu Ser Asp Gly Leu Glu Ser Gly Ala Lys Glu Lys His Lys
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Leu Asp Asn Glu Leu Ile Ser Leu Ala Ser Asp Asp Val Glu Ser Ser
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Ser Gln Lys Asn Ser Gly Val Glu Leu Thr Thr Ala Gln Arg Gln Glu
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Ser Gly Gln Ile Lys Asp Thr Ser Lys Thr Leu Gly Glu Glu Asn			
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Ile Gly Gly Lys Ile Glu Gly Ser Lys Leu Lys Phe Val Asp His His			
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Gln Glu Lys Leu Pro Ile Ser Ser Asn Ile Ile His Asn Ala Ser Pro			
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405

410

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Tyr Thr Met Asp Asp Gln Phe Gly Thr Arg Phe Asn Asn Gln Asn His
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Glu Gln Leu Ala Thr Thr Thr Phe His Gln Gly Asn Gly His Val
465 470 475 480

Ser Leu Thr Leu Gly Leu Pro Pro Asn Ser Glu Asn Gln His Asn Tyr
485 490 495

Ile Gly Leu Glu Asn His Tyr Asn Gln Pro Thr His His Pro Asn Ile
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<212> PRT

<213> Solanum tuberosum

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Gly Asn Gly Gly Ala Ser Ala Ala Thr Ala Thr His His Leu Asn Ala
85 90 95

Gln Asn Glu Ile Gly Gly Val Asn Val Val Glu Ser Gln Gly Leu Ser
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Leu Ser Leu Ser Ser Leu Gln His Lys Ala Glu Glu Glu Leu Gln Met
115 120 125

Ser Gly Glu Ala Gly Gly Met Met Phe Phe Asn Gln Gly Gly Ser Ser
130 135 140

Thr Ser Gly Gln Tyr Arg Tyr Lys Asn Leu Asn Met Gly Gly Ser Gly
145 150 155 160

Val Ser Pro Asn Ile His Gln Val His Val Gly Tyr Gly Ser Ser Leu
165 170 175

Gly Val Val Asn Val Leu Arg Asn Ser Lys Tyr Ala Lys Ala Ala Gln
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Glu Leu Leu Glu Glu Phe Cys Ser Val Gly Arg Gly Lys Leu Lys Lys
195 200 205

Thr Asn Asn Lys Ala Ala Asn Asn Pro Asn Thr Asn Pro Ser Gly
210 215 220

Ala Asn Asn Glu Ala Ser Ser Lys Asp Val Pro Thr Leu Ser Ala Ala
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Asp Arg Ile Glu His Gln Arg Arg Lys Val Lys Leu Leu Ser Met Val
245 250 255

Asp Glu Val Asp Arg Arg Tyr Asn His Tyr Cys Glu Gln Met Gln Met
260 265 270

Val Val Asn Ser Phe Asp Leu Val Met Gly Phe Gly Thr Ala Val Pro
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Tyr Thr Ala Leu Ala Gln Lys Ala Met Ser Arg His Phe Arg Cys Leu
290 295 300

Lys Asp Ala Ile Gly Ala Gln Leu Lys Gln Ser Cys Glu Leu Leu Gly
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Glu Lys Asp Ala Gly Asn Ser Gly Leu Thr Lys Gly Glu Thr Pro Arg
325 330 335

Leu Lys Met Leu Glu Gln Ser Leu Arg Gln Gln Arg Ala Phe His Gln
340 345 350

Met Gly Met Met Glu Gln Glu Ala Trp Arg Pro Gln Arg Gly Leu Pro
355 360 365

Glu Arg Ser Val Asn Ile Leu Arg Ala Trp Leu Phe Glu His Phe Leu
370 375 380

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Arg Leu Trp Lys Pro Met Val Glu Asp Met Tyr Gln Gln Glu Ala Lys															
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Val Ala Ile Asn Ser Phe Ser Glu Asn Gln Ala Thr Phe Pro Thr Asn															
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<211> 589
<212> PRT
<213> Solanum tuberosum

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Asn	Lys	Ile	Asn	Gly	Val	Asp	Asp	Asp	Asp	His	Gly	Pro	Ser	Ser	Ser
50					55					60					
Lys	Asn	Ile	Ile	Ser	Glu	Gln	Phe	Tyr	Gln	His	Gly	Ser	His	Glu	Asn
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Met	Leu	Thr	Thr	Thr	Thr	His	His	Asp	Asp	His	Gln	Gly	Ser	Trp	
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His	His	Asp	Asn	Asn	Arg	Thr	Leu	Leu	Val	Asp	Asp	Pro	Ser	Met	Arg
		100				105				110					
Cys	Val	Phe	Pro	Cys	Glu	Gly	Asn	Glu	Arg	Pro	Ser	His	Gly	Leu	Ser
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Leu	Ser	Leu	Cys	Ser	Ser	Asn	Pro	Ser	Ser	Ile	Gly	Leu	Gln	Ser	Phe
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Glu	Leu	Arg	His	Gln	Asp	Leu	Gln	Gln	Gly	Leu	Ile	His	Asp	Gly	Phe
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Leu	Gly	Lys	Ser	Thr	Asn	Ile	Gln	Gln	Gly	Tyr	Phe	His	His	His	His
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Gln	Val	Arg	Asp	Ser	Lys	Tyr	Leu	Gly	Pro	Ala	Gln	Glu	Leu	Ser	
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Gln	Leu	Leu	Gln	Ser	Leu	Asp	Leu	Leu	Glu	Leu	Gln	Lys	Arg	Lys	Thr
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Lys	Leu	Leu	Gln	Met	Leu	Glu	Glu	Val	Asp	Arg	Arg	Tyr	Lys	His	Tyr
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Cys	Asp	Gln	Met	Lys	Ala	Val	Val	Ser	Ser	Phe	Glu	Ala	Val	Ala	Gly
		260			265				270						
Asn	Gly	Ala	Ala	Thr	Val	Tyr	Ser	Ala	Leu	Ala	Ser	Arg	Ala	Met	Ser
		275			280				285						

Arg His Phe Arg Cys Leu Arg Asp Gly Ile Val Ala Gln Ile Lys Ala
 290 295 300

 Thr Lys Met Ala Met Gly Glu Lys Asp Ser Thr Ser Thr Leu Ile Pro
 305 310 315 320

 Gly Ser Thr Arg Gly Glu Thr Pro Arg Leu Arg Leu Leu Asp Gln Thr
 325 330 335

 Leu Arg Gln Gln Lys Ala Phe Gln Gln Met Asn Met Met Glu Thr His
 340 345 350

 Pro Trp Arg Pro Gln Arg Gly Leu Pro Glu Arg Ser Val Ser Val Leu
 355 360 365

 Arg Ala Trp Leu Phe Glu His Phe Leu His Pro Tyr Pro Ser Asp Val
 370 375 380

 Asp Lys His Ile Leu Ala Arg Gln Thr Gly Leu Ser Arg Ser Gln Val
 385 390 395 400

 Ser Asn Trp Phe Ile Asn Ala Arg Val Arg Leu Trp Lys Pro Met Val
 405 410 415

 Glu Glu Met Tyr Leu Glu Glu Thr Lys Glu Glu Glu Asn Val Gly Ser
 420 425 430

 Pro Asp Gly Ser Lys Ala Leu Ile Asp Asp Met Thr Ile His Gln Ser
 435 440 445

 His Ile Asp His His Gln Ala Asp Gln Lys Pro Asn Leu Val Arg Ile
 450 455 460

 Asp Ser Glu Cys Ile Ser Ser Ile Ile Asn His Gln Pro His Glu Lys
 465 470 475 480

 Asn Asp Gln Asn Tyr Gly Val Ile Arg Gly Gly Asp Gln Ser Phe Gly
 485 490 495

 Ala Ile Glu Leu Asp Phe Ser Thr Asn Ile Ala Tyr Gly Thr Ser Gly
 500 505 510

 Gly Asp His His His Gly Gly Gly Val Ser Leu Thr Leu Gly Leu
 515 520 525

 Gln Gln His Gly Gly Ser Gly Gly Ser Ser Met Gly Leu Thr Thr Phe
 530 535 540

Ser	Ser	Gln	Pro	Ser	His	Asn	Gln	Ser	Ser	Leu	Phe	Tyr	Pro	Arg	Asp
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Asp Asp Gln Val Gln Tyr Ser Ser Leu Leu Asp Ser Glu Asn Gln Asn															
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Leu Pro Tyr Arg Asn Leu Asp Gly Gly Thr Thr Ser Ser															
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															585

<210> 9
 <211> 1939
 <212> DNA
 <213> Solanum tuberosum

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 caattcatgt gtggaggagc aagtacttct tcaaatccaa ttggaggagt aaatgtgatt 480
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 aaagtggaaatg atttgaggat gaatagtggaa ggagaaatgt tgttttcaa tcaagaaagt 600
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 attatttatttca accatcaatttca taacattaca gaaacaaaatc cagctgccac tgccacaattt 1560
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 aatacacatttcaatttcaacttgc caatggatca accatggatca accatggatca 1680
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taattaagat agtgtattca aacactgcta cataaattat gatttatat atatatata 1920
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<211> 620
<212> PRT
<213> Solanum tuberosum

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Asn Asn Tyr Arg His Pro Asn Gln Gln Pro His His Gln Pro Pro Thr
35 40 45

Arg Glu Trp Phe Gly Asn Arg Gln Glu Ile Val Val Gly Gly Ser Leu
50 55 60

Gln Val Thr Phe Gly Asp Thr Lys Asp Asp Val Asn Ala Lys Val Leu
65 70 75 80

Leu Ser Asn Arg Asp Ser Val Thr Asp Tyr Tyr Gln Arg Gln His Asn
85 90 95

Gln Val Pro Ser Ile Asn Thr Ala Glu Ser Met Gln Leu Phe Leu Met
100 105 110

Asn Pro Gln Pro Ser Ser Pro Ser Gln Ser Thr Pro Ser Thr Leu His
115 120 125

Gln Gly Phe Ser Ser Pro Val Gly Gly His Phe Ser Gln Phe Met Cys
130 135 140

Gly Gly Ala Ser Thr Ser Ser Asn Pro Ile Gly Gly Val Asn Val Ile
145 150 155 160

Asp Gln Gly Gln Gly Leu Ser Leu Ser Leu Ser Ser Thr Leu Gln His
165 170 175

Leu Glu Ala Ser Lys Val Glu Asp Leu Arg Met Asn Ser Gly Gly Glu
180 185 190

Met Leu Phe Phe Asn Gln Glu Ser Gln Asn His His Asn Ile Gly Phe
195 200 205

Gly Ser Ser Leu Gly Leu Val Asn Val Leu Arg Asn Ser Lys Tyr Val
 210 215 220
 Lys Ala Thr Gln Glu Leu Leu Glu Glu Phe Cys Cys Val Gly Lys Gly
 225 230 235 240
 Gln Leu Phe Lys Lys Ile Asn Lys Val Ser Arg Asn Asn Asn Thr Ser
 245 250 255
 Thr Ser Pro Ile Ile Asn Pro Ser Gly Ser Asn Asn Asn Ser Ser
 260 265 270
 Ser Ser Lys Ala Ile Ile Pro Pro Asn Leu Ser Thr Ala Glu Arg Leu
 275 280 285
 Asp His Gln Arg Arg Lys Val Lys Leu Leu Ser Met Leu Asp Glu Val
 290 295 300
 Glu Lys Arg Tyr Asn His Tyr Cys Glu Gln Met Gln Met Val Val Asn
 305 310 315 320
 Ser Phe Asp Leu Val Met Gly Phe Gly Ala Ala Val Pro Tyr Thr Ala
 325 330 335
 Leu Ala Gln Lys Ala Met Ser Arg His Phe Lys Cys Leu Lys Asp Gly
 340 345 350
 Val Ala Ala Gln Leu Lys Lys Thr Cys Glu Ala Leu Gly Glu Lys Asp
 355 360 365
 Ala Ser Ser Ser Ser Gly Leu Thr Lys Gly Glu Thr Pro Arg Leu Lys
 370 375 380
 Val Leu Glu Gln Ser Leu Arg Gln Gln Arg Ala Phe Gln Gln Met Gly
 385 390 395 400
 Met Met Glu Gln Glu Ala Trp Arg Pro Gln Arg Gly Leu Pro Glu Arg
 405 410 415
 Ser Val Asn Ile Leu Arg Ala Trp Leu Phe Glu His Phe Leu His Pro
 420 425 430
 Tyr Pro Ser Asp Ala Asp Lys His Leu Leu Ala Arg Gln Thr Gly Leu
 435 440 445
 Ser Arg Asn Gln Val Ala Asn Trp Phe Ile Asn Ala Arg Val Arg Leu
 450 455 460

Trp Lys Pro Met Val Glu Glu Met Tyr Gln Arg Glu Val Asn Glu Asp			
465	470	475	480
Asp Val Asp Asp Met Gln Glu Asn Gln Asn Ser Thr Asn Thr Gln Ile			
485	490	495	
Pro Thr Pro Asn Ile Ile Ile Thr Thr Asn Ser Asn Ile Thr Glu Thr			
500	505	510	
Lys Ser Ala Ala Thr Ala Thr Ile Ala Ser Asp Lys Lys Pro Gln Ile			
515	520	525	
Asn Val Ser Glu Ile Asp Pro Ser Ile Val Ala Met Asn Thr His Tyr			
530	535	540	
Ser Ser Ser Met Pro Thr Gln Leu Thr Asn Phe Pro Thr Ile Gln Asp			
545	550	555	560
Glu Ser Asp His Ile Leu Tyr Arg Arg Ser Gly Ala Glu Tyr Gly Thr			
565	570	575	
Thr Asn Met Ala Ser Asn Ser Glu Ile Gly Ser Asn Met Ile Thr Phe			
580	585	590	
Gly Thr Thr Thr Ala Ser Asp Val Ser Leu Thr Leu Gly Leu Arg His			
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Ala Gly Asn Leu Pro Glu Asn Thr His Phe Ser Gly			
610	615	620	

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 <211> 2128
 <212> DNA
 <213> Solanum tuberosum

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<211> 567

<212> PRT

<213> Solanum tuberosum

<400> 12

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Ser	Ala	Ser	Gly	Ile	Gln	Gln	Gln	Gln	Gln	Gln	Ser	Ile	Ser	
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														45

Ser	Val	Pro	Leu	Ser	Ser	Lys	Tyr	Met	Lys	Ala	Ala	Gln	Glu	Leu	Leu
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															60

Asp	Glu	Val	Val	Asn	Val	Gly	Lys	Ser	Met	Lys	Ser	Thr	Asn	Ser	Thr
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Asp Val Val Val Asn Asn Asp Val Lys Lys Ser Lys Asn Met Gly Asp		
85	90	95
Met Asp Gly Gln Leu Asp Gly Val Gly Ala Asp Lys Asp Gly Ala Pro		
100	105	110
Thr Thr Glu Leu Ser Thr Gly Glu Arg Gln Glu Ile Gln Met Lys Lys		
115	120	125
Ala Lys Leu Val Asn Met Leu Asp Glu Val Glu Gln Arg Tyr Arg His		
130	135	140
Tyr His His Gln Met Gln Ser Val Ile His Trp Leu Glu Gln Ala Ala		
145	150	155
Gly Ile Gly Ser Ala Lys Thr Tyr Thr Ala Leu Ala Leu Gln Thr Ile		
165	170	175
Ser Lys Gln Phe Arg Cys Leu Lys Asp Ala Ile Ile Gly Gln Ile Arg		
180	185	190
Ser Ala Ser Gln Thr Leu Gly Glu Asp Ser Leu Gly Gly Lys Ile		
195	200	205
Glu Gly Ser Arg Leu Lys Phe Val Asp Asn Gln Leu Arg Gln Gln Arg		
210	215	220
Ala Leu Gln Gln Leu Gly Met Ile Gln His Asn Ala Trp Arg Pro Gln		
225	230	235
Arg Gly Leu Pro Glu Arg Ala Val Ser Val Leu Arg Ala Trp Leu Phe		
245	250	255
Glu His Phe Leu His Pro Tyr Pro Lys Asp Ser Asp Lys Met Met Leu		
260	265	270
Ala Lys Gln Thr Gly Leu Thr Arg Ser Gln Val Ser Asn Trp Phe Ile		
275	280	285
Asn Ala Arg Val Arg Leu Trp Lys Pro Met Val Glu Glu Met Tyr Leu		
290	295	300
Glu Glu Ile Lys Glu His Glu Gln Asn Gly Leu Gly Gln Glu Lys Thr		
305	310	315
Ser Lys Leu Gly Glu Gln Asn Glu Asp Ser Thr Thr Ser Arg Ser Ile		
325	330	335

Ala Thr Gln Asp Lys Ser Pro Gly Ser Asp Ser Gln Asn Lys Ser Phe
 340 345 350

 Val Ser Lys Gln Asp Asn His Leu Pro Gln His Asn Pro Ala Ser Pro
 355 360 365

 Met Pro Asp Val Gln Arg His Phe His Thr Pro Ile Gly Met Thr Ile
 370 375 380

 Arg Asn Gln Ser Ala Gly Phe Asn Leu Ile Gly Ser Pro Glu Ile Glu
 385 390 395 400

 Ser Ile Asn Ile Thr Gln Gly Ser Pro Lys Lys Pro Arg Asn Asn Glu
 405 410 415

 Met Leu His Ser Pro Asn Ser Ile Pro Ser Ile Asn Met Asp Val Lys
 420 425 430

 Pro Asn Glu Glu Gln Met Ser Lys Phe Gly Asp Asp Arg Gln Asp
 435 440 445

 Arg Asp Gly Phe Ser Leu Met Gly Gly Pro Met Asn Phe Met Gly Gly
 450 455 460

 Phe Gly Ala Tyr Pro Ile Gly Glu Ile Ala Arg Phe Ser Thr Glu Gln
 465 470 475 480

 Phe Ser Ala Pro Tyr Ser Thr Ser Gly Thr Val Ser Leu Thr Leu Gly
 485 490 495

 Leu Pro His Asn Glu Asn Leu Ser Met Ser Ala Thr His His Ser Phe
 500 505 510

 Leu Pro Ile Pro Thr Gln Asn Ile Gln Ile Gly Ser Glu Pro Asn His
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 Glu Phe Gly Ser Leu Asn Thr Pro Thr Ser Ala His Ser Thr Ser Ser
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 Leu Leu Pro Asp Phe Val Ala
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<212> DNA
<213> Solanum tuberosum

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gtgaagaag caacctacccatg atgtccatcg aaactcacgt tagttatgttgc当地tca 1860
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<210> 14
<211> 645
<212> PRT
<213> Solanum tuberosum

<400> 14

Met	Ala	Thr	Tyr	Phe	Pro	Ser	Pro	Asn	Asn	Gln	Arg	Asp	Ala	Asp	Gln
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Thr	Phe	Gln	Tyr	Phe	Arg	Gln	Ser	Leu	Pro	Glu	Ser	Tyr	Ser	Glu	Ala
		20				25					30				
Ser	Asn	Ala	Pro	Glu	Asn	Met	Met	Val	Phe	Met	Asn	Tyr	Ser	Ser	Ser
		35				40					45				
Gly	Ala	Tyr	Ser	Asp	Met	Leu	Thr	Gly	Thr	Ser	Gln	Gln	Gln	His	Asn
		50			55					60					
Cys	Ile	Asp	Ile	Pro	Ser	Ile	Gly	Ala	Thr	Pro	Phe	Asn	Thr	Ser	Gln
		65			70				75			80			
Gln	Glu	Ile	Leu	Ser	Asn	Leu	Gly	Gly	Ser	Gln	Met	Gly	Ile	Gln	Asp
		85				90					95				
Phe	Ser	Ser	Trp	Arg	Asp	Ser	Arg	Asn	Glu	Met	Leu	Ala	Asp	Asn	Val
		100				105					110				
Phe	Gln	Val	Ala	Gln	Asn	Val	Gln	Gly	Gln	Gly	Leu	Ser	Leu	Ser	Leu
		115				120					125				
Gly	Ser	Asn	Ile	Pro	Ser	Gly	Ile	Gly	Ile	Ser	His	Val	Gln	Ser	Gln
		130			135					140					
Asn	Pro	Asn	Gln	Gly	Gly	Phe	Asn	Met	Ser	Phe	Gly	Asp	Gly	Asp	
		145			150			155			160				
Asn	Ser	Gln	Pro	Lys	Glu	Gln	Arg	Asn	Ala	Asp	Tyr	Phe	Pro	Pro	Asp
		165				170					175				
Asn	Pro	Gly	Arg	Asp	Leu	Asp	Ala	Met	Lys	Gly	Tyr	Asn	Ser	Pro	Tyr
		180				185					190				
Gly	Thr	Ser	Ser	Ile	Ala	Arg	Thr	Ile	Pro	Ser	Ser	Lys	Tyr	Leu	Lys
		195				200					205				
Ala	Ala	Gln	Tyr	Leu	Leu	Asp	Glu	Val	Val	Ser	Val	Arg	Lys	Ala	Ile
		210			215					220					
Lys	Glu	Gln	Asn	Ser	Lys	Lys	Glu	Leu	Thr	Lys	Asp	Ser	Arg	Glu	Ser
		225			230				235			240			
Asp	Val	Asp	Ser	Lys	Asn	Ile	Ser	Ser	Asp	Thr	Pro	Ala	Asn	Gly	Gly
		245				250					255				

Ser Asn Pro His Glu Ser Lys Asn Asn Gln Ser Glu Leu Ser Pro Thr
 260 265 270

 Glu Lys Gln Glu Val Gln Asn Lys Leu Ala Lys Leu Leu Ser Met Leu
 275 280 285

 Asp Glu Ile Asp Arg Arg Tyr Arg Gln Tyr Tyr His Gln Met Gln Ile
 290 295 300

 Val Val Ser Ser Phe Asp Val Val Ala Gly Glu Gly Ala Ala Lys Pro
 305 310 315 320

 Tyr Thr Ala Leu Ala Leu Gln Thr Ile Ser Arg His Phe Arg Cys Leu
 325 330 335

 Arg Asp Ala Ile Cys Asp Gln Ile Arg Ala Ser Arg Arg Ser Leu Gly
 340 345 350

 Glu Gln Asp Ala Ser Glu Asn Ser Lys Ala Ile Gly Ile Ser Arg Leu
 355 360 365

 Arg Phe Val Asp His His Ile Arg Gln Gln Arg Ala Leu Gln Gln Leu
 370 375 380

 Gly Met Met Gln Gln His Ala Trp Arg Pro Gln Arg Gly Leu Pro Glu
 385 390 395 400

 Ser Ser Val Ser Val Leu Arg Ala Trp Leu Phe Glu His Phe Leu His
 405 410 415

 Pro Tyr Pro Lys Asp Ser Asp Lys Ile Met Leu Ala Arg Gln Thr Gly
 420 425 430

 Leu Thr Arg Ser Gln Val Ser Asn Trp Phe Ile Asn Ala Arg Val Arg
 435 440 445

 Leu Trp Lys Pro Met Val Glu Glu Met Tyr Lys Glu Glu Ala Gly Asp
 450 455 460

 Ala Lys Ile Asp Ser Asn Ser Ser Asp Val Ala Pro Arg Leu Ala
 465 470 475 480

 Thr Lys Asp Ser Lys Val Glu Glu Arg Gly Glu Leu His Gln Asn Ala
 485 490 495

 Ala Ser Glu Phe Glu Gln Tyr Asn Ser Gly Gln Ile Leu Glu Ser Lys
 500 505 510

Ser Asn His Glu Ala Asp Val Glu Met Glu Gly Ala Ser Asn Ala Glu
515 520 525

Thr Gln Ser Gln Ser Gly Met Glu Asn Gln Thr Gly Glu Pro Leu Pro
530 535 540

Ala Met Asp Asn Cys Thr Leu Phe Gln Asp Ala Phe Val Gln Ser Asn
545 550 555 560

Asp Arg Phe Ser Glu Phe Gly Ser Phe Gly Ser Gly Asn Val Leu Pro
565 570 575

Asn Gly Val Ser Leu Thr Leu Gly Leu Gln Gln Gly Glu Gly Ser Asn
580 585 590

Leu Pro Met Ser Ile Glu Thr His Val Ser Tyr Val Pro Leu Arg Ala
595 600 605

Asp Asp Met Tyr Ser Thr Ala Pro Thr Thr Met Val Pro Glu Thr Ala
610 615 620

Glu Phe Asn Cys Leu Asp Ser Gly Asn Arg Gln Gln Pro Phe Trp Leu
625 630 635 640

Leu Pro Ser Ala Thr
645

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<211> 7
<212> PRT
<213> Solanum tuberosum

<400> 15
Val Ser Leu Thr Leu Gly Leu
1 5

<210> 16
<211> 1383
<212> DNA
<213> Solanum tuberosum

<400> 16
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aaatttctca ttgttattt tctaagtat ttacactact ttgttatttt gtttgtttt 120
tttagatat atatatggat gatgaaatgt atggtttca ttcaacaaga gacgattacg 180
cgataaaggc ttgtatgtca ccggagaatt tgatgtatgc aactgagttac aacaatttcc 240

acaactatac caactcggtcc atcttgactt ctaatccgat gatgttgga tccgatgata 300
ttcaattatc atcggAACAA actaattctt tcagttactat gactctcaa aataatgata 360
atatttatca aattagaagt ggaaattgtg gcggaggcag tggcagtgg gtagcagta 420
aggatcataa tgataataac aataataatg aagattatga tgaagatgg tcaaattgtt 480
tcaaggctaa aatcgctca catccttatt atcctaaatt actcaacgct tatattgatt 540
gccaagggt tggagcacca gcgggtatag taaatctgct ggaagaaaata aggcaacaaa 600
ctgatttcg taaacccaaac gctacttcta tatgtatagg agctgatcct gaacttgatg 660
agtttatgga aacgtattgt gatatattgt tgaagtataa gtccgatctg tctaggcct 720
ttgatgaagc aacaacgttc ctcaacaaga ttgaaatgca actaggtaat cttgcaaag 780
atgatgggg tgtatcatca gatgaggagt taagttgtgg tgaggcagat gcatcaatga 840
gaagtgagga taatgaactc aaagatagac tcctacgtaa gtttggaaagt catttaagta 900
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aaa 1383

<210> 17

<211> 345

<212> PRT

<213> Solanum tuberosum

<400> 17

Met Asp Asp Glu Met Tyr Gly Phe His Ser Thr Arg Asp Asp Tyr Ala
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Asp Lys Ala Leu Met Ser Pro Glu Asn Leu Met Met Gln Thr Glu Tyr
20 25 30

Asn Asn Phe His Asn Tyr Thr Asn Ser Ser Ile Leu Thr Ser Asn Pro
35 40 45

Met Met Phe Gly Ser Asp Asp Ile Gln Leu Ser Ser Glu Gln Thr Asn
50 55 60

Ser Phe Ser Thr Met Thr Leu Gln Asn Asn Asp Asn Ile Tyr Gln Ile
65 70 75 80

Arg Ser Gly Asn Cys Gly Gly Ser Gly Ser Gly Ser Ser Lys
85 90 95

Asp His Asn Asp Asn Asn Asn Asn Glu Asp Tyr Asp Glu Asp Gly
100 105 110

Ser Asn Val Ile Lys Ala Lys Ile Val Ser His Pro Tyr Tyr Pro Lys
115 120 125

Leu Leu Asn Ala Tyr Ile Asp Cys Gln Lys Val Gly Ala Pro Ala Gly
130 135 140

Ile Val Asn Leu Leu Glu Glu Ile Arg Gln Gln Thr Asp Phe Arg Lys
145 150 155 160

Pro Asn Ala Thr Ser Ile Cys Ile Gly Ala Asp Pro Glu Leu Asp Glu
165 170 175

Phe Met Glu Thr Tyr Cys Asp Ile Leu Leu Lys Tyr Lys Ser Asp Leu
180 185 190

Ser Arg Pro Phe Asp Glu Ala Thr Thr Phe Leu Asn Lys Ile Glu Met
195 200 205

Gln Leu Gly Asn Leu Cys Lys Asp Asp Gly Gly Val Ser Ser Asp Glu
210 215 220

Glu Leu Ser Cys Gly Glu Ala Asp Ala Ser Met Arg Ser Glu Asp Asn
225 230 235 240

Glu Leu Lys Asp Arg Leu Leu Arg Lys Phe Gly Ser His Leu Ser Ser
245 250 255

Leu Lys Leu Glu Phe Ser Lys Lys Lys Lys Gly Lys Leu Pro Lys
260 265 270

Glu Ala Arg Gln Met Leu Leu Ala Trp Trp Asp Asp His Phe Arg Trp
275 280 285

Pro Tyr Pro Thr Glu Ala Asp Lys Asn Ser Leu Ala Glu Ser Thr Gly
290 295 300

Leu Asp Pro Lys Gln Ile Asn Asn Trp Phe Ile Asn Gln Arg Lys Arg
305 310 315 320

His Trp Lys Pro Ser Glu Asn Met Gln Leu Ala Val Met Asp Asn Leu
325 330 335

Ser Ser Gln Phe Phe Ser Ser Asp Asp
340 345

<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 18
aagaagaaga agaaaaggaa

20

<210> 19
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 19
atgaaccagt tggat

17

<210> 20
<211> 10
<212> DNA
<213> Solanum tuberosum

<400> 20
ttgacttgac

10

<210> 21
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 21
ggatccttga agtggctctt ctct

24

<210> 22
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 22
aatctagaga cactctcttt ttcgt 25

<210> 23
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 23
ctatttgact tcacacgggtt attt 24

<210> 24
<211> 24
<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

<400> 24
aaataaccgt gtgaagtcaa atag 24

<210> 25
<211> 8
<212> DNA
<213> Solanum tuberosum

<400> 25
tgacagst 8

<210> 26
<211> 9
<212> DNA
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<400> 26
tgacttgac 9

<210> 27
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<212> DNA
<213> Solanum tuberosum

<400> 27
tgaswtgac

9

<210> 28
<211> 10
<212> DNA
<213> Solanum tuberosum

<400> 28
tgattgacag

10